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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,225	04/14/2004	Dieter Ritter	P04,0101	6358

7590 12/12/2005

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EXAMINER	
ARTMAN, THOMAS R	
ART UNIT	**PAPER NUMBER**
2882	

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/824,225	RITTER, DIETER	
	Examiner	Art Unit	
	Thomas R. Artman	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *19 August 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Suuronen (US 6,614,875 B2).

Regarding claims 1 and 7, Suuronen discloses an apparatus and method (Figs.1, 2 and 4), including:

a) an X-ray imaging system having a carrier support 3, 3a, 4 with an X-ray source 5 and a radiation detector (not shown, positioned on leg 4, see col.2, lines 33-40) allowing an examination subject (not shown) to be disposed between the X-ray source and the radiation detector,

b) a supporting arrangement 1 for the carrier support for moving the support relative to the examination subject for acquiring a series of 2D projections of the examination subject with the X-ray source and the radiation detector,

c) an optical 3D sensor 13 mounted to the carrier support 3a, and

d) the supporting arrangement for the carrier support also moves the support relative to the examination subject for acquiring an image dataset with the optical 3D sensor representing at least a portion of a surface of the examination subject (see at least col.3, lines 11-19).

With respect to claims 2 and 8, Suuronen further discloses that the carrier support is a C-arm 3.

With respect to claims 3 and 9, Suuronen further discloses that the C-arm has a circumference 1, where the supporting arrangement moves the C-arm along the circumference 1 during acquisition of the series of 2D projections.

With respect to claims 4 and 10, Suuronen further discloses that the supporting arrangement moves the C-arm through an angulation movement 1 for acquiring the series of 2D projections.

With respect to claims 5 and 11, Suuronen further discloses that the C-arm and the supporting arrangement form an isocentric apparatus (see Figs).

With respect to claims 6 and 12, Suuronen further discloses that a computer 20 supplied with the series of 2D projections calculates a volume dataset of the body of the examination subject, and for combining the image dataset with the volume dataset by superposition (see at least col.3, lines 51-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Navab (US 5,923,727) in view of Asahina (US 5,539,798).

Regarding claims 1 and 7, Navab discloses an apparatus and method (Figs.2 and 7-10), including:

a) an X-ray imaging system having a carrier support (C-arm) with an X-ray source and a radiation detector allowing an examination subject to be disposed between the X-ray source and the radiation detector,

b) a supporting arrangement (Fig.2) for the carrier support for moving the support relative to the examination subject for acquiring a series of 2D projections of the examination subject with the X-ray source and the radiation detector,

c) an optical 3D sensor 22 mounted to the carrier support, and

d) the supporting arrangement for the carrier support also moves the support relative to the examination subject for acquiring an image dataset with the optical 3D sensor representing at least a portion of a surface of an object (optical phantom, see at least Fig.9).

Navab does not specifically disclose that the image data set is that of the examination subject. The image data set is of a phantom placed in a known spatial relationship with the examination subject.

Asahina specifically teaches the practice of taking an X-ray projection of an examination subject and further using an optical sensor for acquiring an image data set of the surface contour of the examination subject and superimposing the two (Figs.16 and 17C). Asahina also uses the optical system to directly image the examination subject surface for proper positioning of the system (Figs.4 and 6). In each case, Asahina images the examination subject directly for greater accuracy and precision, rather than relying upon additional, separate structures such as the phantom of Navab, where additional errors can result due to imperfect positioning and measurement of that position relative to the examination subject.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the image data sets of Navab to be of the surface of the examination subject, rather than a separate phantom, in order to improve the accuracy and precision of positioning and image superimposition, as shown by Asahina.

With respect to claims 2 and 8, Navab further discloses that the carrier support is a C-arm (Fig.2).

With respect to claims 3 and 9, Navab further discloses that the C-arm has a circumference, where the supporting arrangement moves the C-arm along the circumference during acquisition of the series of 2D projections (Figs.8 and 10).

With respect to claims 4 and 10, Navab further discloses that the supporting arrangement moves the C-arm through an angulation movement for acquiring the series of 2D projections (Figs.8 and 10).

With respect to claims 5 and 11, Navab further discloses that the C-arm and the supporting arrangement form an isocentric apparatus (see Figs.8 and 10).

With respect to claims 6 and 12, the Navab/Asahina combination has a computer 20 supplied with the series of 2D projections calculates a volume dataset of the body of the examination subject, and for combining the image dataset with the volume dataset by fusion (Figs.7 and 9 of Navab) or by superposition (Figs.16 and 17C of Asahina).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Schmitz (US 6,050,724) teaches the practice of using optical 3D imaging techniques for accurately determining the positions of the patient and other devices used in surgical procedures. Postlethwaite (US 6,088,424) teaches the use of optical and X-ray imaging of a patient. Simon (US 6,470,207 B1) teaches the practice of using 3D optical methods for determining the precise positions of devices in a surgical environment involving X-ray imaging.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R. Artman whose telephone number is (571) 272-2485. The examiner can normally be reached on 9am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas R. Artman
Patent Examiner

Craig E. Church

Craig E. Church
Primary Examiner